TABLE 4—*Summary of Table 2 comparing Paris and Washington winters.*

Paris, cold Washington, cold	1886, 1887, 1892, 1894	4
Paris, cold Washington, normal	1906	1
Paris, cold Washington, warm	1875, 1879, 1888, 1890, 1891, 1908	6
Paris, normal Washington, cold	1874, 1878, 1880, 1884, 1885, 1899	6
Paris, normal Washington, normal	None	0
Paris, normal Washington, warm	1889, 1902, 1907	3
Paris, warm Washington, cold	1872, 1876, 1882, 1898, 1901, 1903, 1904, 1911	8
Paris, warm Washington, normal	1895, 1900	2
Paris, warm Washington, warm	1873, 1877, 1881, 1883, 1896, 1897, 1905, 1909, 1910	9

It is not the present purpose to further discuss the reasons underlying these constant differences between Paris and Washington or the occasional reversals in the relations. Undoubtedly their immediate causes are closely associated with the prevailing distribution of the great "centers of action," and the occasional disturbances arise from some dislocation of the latter. The chief aim has been to contribute the characteristic winter sums for Washington computed according to the method suggested by Dr. Angot; and to further examine the truth of his contention that these sums furnish a more useful and significant method for comparing winter conditions than do the usual means, extreme minima, and their departures.

It is hoped that in the future similar data for Washington may be presented for the period, 1838–1870, inclusive.

ON A METHOD FOR CLASSIFYING SUMMERS.[1]

By ALFRED ANGOT.

[Translated for the MONTHLY WEATHER REVIEW by Miss R. E. Edwards.]

Several months ago the author proposed a method of classifying winters,[2] based on the comparison of the sums of the minimum temperatures below 0°C. These sums take into account both the intensity and the duration of the cold periods.

An analogous procedure may be applied to the summers by taking the sum of all the daily maximum temperatures above a certain limit. Take, for example, two different limits such as 25°C. and 30°C.; to form these sums one takes all the daily maxima, deducting from them the value which corresponds to the temperature chosen as the point of departure. In case 25°C. is selected as that point, a temperature of 25° or less will be counted as 0, a temperature of 26° as 1°, and so on. The two accompanying tables contain the sums of the maximum temperatures above 25° and 30°, respectively, at Parc Saint-Maur, Paris, for a period of 41 years. In Table 1 below it has seemed unnecessary to retain the fractions of a degree; the months in which the temperature has not once reached 25°C. are designated by leaders; the figure 0 indicates that there, on the other hand, the temperature has exceeded 25°C., but that the sum is less than 0.5°C. In Table 2 it has seemed necessary to give the fractions of a degree because of the smallness of the majority of the numbers that enter into the table.

Without going into a detailed study of these tables, we may indicate some of the general results they lead to.

Temperatures above 25°C.—The average annual total at Parc Saint-Maur is 117°C., distributed through the seven months, April to October. The maximum monthly average sum is 43°C., and falls in the month of July. The annual sums are extremely variable, the three greatest and the three smallest are, respectively:

	°C.		°C.
1911	357	1910	22
1911	199	1882	31
1899	194	1879	37

During the 41 years here considered, then, the sums have varied between 22° and 357°; this gives a very extensive scale of comparison and permits a ready classification of the summers.

The maximum value, 357°, in 1911, is three times the average annual value and exceeds by nearly 160° the greatest maximum previously known, a fact that brings into prominence the altogether exceptional character of the summer of 1911. It is a curious fact that the two extremes of the series occurred in two consecutive years. One does not notice, at any rate not at first sight, that there is any periodicity in the hot summers and cold summers.

Not only are the annual sums very variable, but the distribution among the different months is also very irregular. The months that give the two largest sums in the average year are ordinarily July and August, but sometimes the largest sum characterizes June (as in 1877, 1878, 1885, 1888, 1889, 1897, and 1908), and in exceptional cases may even fall to September (as in 1891 and 1895). It would be interesting to investigate the relation of these sums to the phenomena of vegetation, and also the influence of early and late warm spells. These numbers seem to lend themselves better to this study than do the mean temperatures and the absolute extremes.

TABLE 1.—*Sums of maximum temperatures* exceeding 25°C. *at Parc Saint-Maur, Paris.*

Year.	April.	May.	June.	July.	August.	September.	October.	Year.
1873	0	......	14	56	43	......	1	114
1874	11	14	32	112	12	12	......	193
1875	3	9	25	9	41	10	......	97
1876	......	2	19	75	92	0	......	188
1877	......	......	65	30	36	1	......	132
1878	......	4	24	23	7	2	......	60
1879	......	......	2	6	27	2	......	37
1880	......	17	9	43	31	21	......	121
1881	......	1	11	120	12	......	......	144
1882	1	......	3	14	10	3	......	31
1883	......	18	16	22	38	......	......	94
1884	......	17	16	75	76	9	......	193
1885	0	6	47	39	19	6	......	117
1886	2	8	4	45	39	25	1	124
1887	......	......	33	66	34	......	......	133
1888	......	3	28	3	22	7	......	63
1889	......	2	44	30	22	13	......	111
1890	......	9	11	21	17	2	......	60
1891	......	1	8	10	9	14	......	42
1892	......	38	19	32	60	7	......	156
1893	14	4	39	45	69	6	......	177
1894	0	7	12	41	16	6	......	82
1895	......	8	15	20	32	100	......	185
1896	......	4	16	55	2	0	......	77
1897	......	4	30	17	17	1	......	69
1898	......	1	3	16	86	42	......	148
1899	......	1	25	54	94	20	......	194
1900	1	4	26	129	22	15	2	199
1901	......	7	38	70	38	6	......	159
1902	......	2	15	43	11	5	......	76
1903	......	14	16	22	8	15	......	75
1904	......	10	15	117	46	......	......	188
1905	......	8	14	49	23	2	......	96
1906	......	7	27	48	47	33	0	162
1907	......	10	3	9	35	7	......	64
1908	......	6	32	26	11	7	1	83
1909	2	15	4	0	38	......	......	59
1910	......	0	8	8	5	1	......	22
1911	......	3	14	119	133	88	......	357
1912	......	16	15	44	......	......	......	75
1913	2	15	8	4	19	1	......	49
Averages	0.9	7.2	19.6	43.1	34.1	12.1	0.2	117.2

[1] Angot, Alfred. Sur un mode de classification des étés. Annuaire de la Société météorol. de France, Paris, Décembre 1913, 61: 341-345.

[2] See page 625, above.

Temperatures above 30° C.—The average annual value of the sums above 30°C. is 15; they vary from 0 in 1878, 1891, and 1913 to 99 in 1911. Although they vary pretty much in the same way as do the sums counted above 25°, there are appreciable differences in details.

In the year 1910, which gives the smallest sum above 25°, the temperature did not once reach 30°C., but the three other years, 1878, 1891, and 1913, when the same phenomenon occurred, rank much higher in the table of sums above 25°C. In the same way the year 1899 comes to stand third among the temperatures above 25° and only sixth among the temperatures above 30°.

From the point of view of classification of summers, this method gives results to a certain extent dependent upon the temperature selected for the lower or starting point. Evidently one may choose other than the limits 25° and 30° selected by the author; and one might very properly investigate the limit that best presents the relations between temperature and certain phenological phenomena. It is even probable that this limiting temperature differs according to the phenomenon considered; however, one may remark that there would be no considerable advantage in selecting a limit higher than 30°C. since this would greatly increase the number of years characterized by zero sums. On the other hand, if the limiting temperature is notably less than 25°C., the differences between the years will be greatly reduced, and one would more and more closely approach the results obtained by discussing the mean monthly maxima. It thus appears that one should seek to fix upon some temperature between 25° and 30° as the lowest limit proper for the study of different phenomena. In provisionally adopting 25°C. as the lower limit the results should not greatly differ from those that one would find by using a limit determined by means of a more thorough discussion.

TABLE 2.—*Sums of maximum temperatures* exceeding 30°C. *at Parc Saint-Maur, Paris.*

Year.	May.	June.	July.	August.	September.	Year.
1873		1.6	5.6	9.1		16.3
1874	1.6	1.9	34.3		3.8	41.6
1875		3.0		7.4		10.4
1876		2.3	5.4	28.3		36.0
1877		7.3	4.2	2.6		14.1
1878						
1879				2.5		2.5
1880	2.2		1.5		0.0	3.7
1881			42.0	1.5		43.5
1882				1.5		1.5
1883		0.2	0.3			0.5
1884		0.0	9.5	9.5		19.0
1885	0.4	3.5	0.6	1.5		6.0
1886			3.6	3.2	1.6	8.4
1887		0.8	9.9	4.0		14.7
1888		4.5		0.5		5.0
1889		0.3	0.2		0.1	0.6
1890		1.1	0.6	2.6		4.3
1891						
1892	4.8	0.7	0.6	14.7		20.8
1893		5.5	8.6	13.3		27.4
1894		0.2	5.4	1.6		7.2
1895				2.5	23.3	25.8
1896			4.0			4.0
1897		3.0		0.8		3.8
1898				21.2	5.8	27.0
1899		0.0	3.3	22.8	3.4	29.5
1900		1.5	41.1	2.5		45.1
1901		5.9	8.5	1.6		16.0
1902			5.5			5.5
1903		2.3	2.2		2.4	6.9
1904			24.7	5.1		29.8
1905			2.0	1.6		5.6
1906		3.1	6.1	6.7	8.1	24.0
1907				4.7		4.7
1908		1.5	0.4			1.9
1909	0.2			2.0		2.2
1910						
1911			29.9	40.9	28.5	99.3
1912	2.5	1.5	6.9			10.9
1913						
Averages	0.3	1.2	6.5	5.3	1.9	15.2

DROUGHT AT NEW YORK CITY.

By C. D. REED, Local Forecaster.

[Dated Weather Bureau, New York, N. Y., Oct. 31, 1914.]

From August 30 to October 15, 1914, inclusive, occurred one of the most notable droughts in the 44 years of record at this station, and the resulting general interest by the public inspired the preparation of this study of local droughts at New York. It may not be amiss to note that the inquiries included such a vague and irrational idea as that the drought might be caused by the European war, where the use of large quantities of explosives, perhaps by causing heavy rains, drew the atmospheric moisture from this city. This was akin to another unscientific idea, that because there was a drought in New York there must be one over most of the United States, which was of course untrue as rains were frequent and copious in the Lower Missouri and Middle Mississippi valleys and the Southwest, but about normal in other sections, except the Atlantic States where the drought was more or less prevalent.

One of the more frequent questions was, "Is not this the worst drought on record?" The difficulty in answering this question positively will be apparent from a study of Table 2, page 630–1, which shows that this drought held the record for least rainfall up to its twenty-fifth day; that it also held the record of minimum up to the forty-second to forty-seventh days of its continuance; and that the record for all other periods of duration was held by other droughts.

There are several factors that enter into the case aside from the minimum amount of rain in a given number of days, such as the amount and character of the precipitation during the 30 days preceding; the maximum number of consecutive days without or practically without precipitation; the frequency and quantity of the precipitation by which the drought is broken; and the season of the drought's occurrence.

With respect to the supply of water in lakes, reservoirs, and cisterns, drought is most effectually broken when there are a few heavy downpours, with a total sufficiently large to make up the accumulated deficiency; but with respect to most vegetation the breaking of a drought is quite effectual when there are several gentle showers, though they lack much of making up an accumulated deficiency. In the vicinity of New York City a prolonged drought at any time from March 1 to August 15 is injurious to all vegetation; and some vegetables may be injured as late as the last of October. Winter droughts are of importance mainly in regions where the water-supply is dependent upon storage in the form of snow in adjacent mountains.

Nineteen of the more notable droughts at this station were selected and arranged in Table 2 (p. 630) for comparison. In general only such periods were chosen as showed precipitation of 0.10 inch or less in 10 days; 0.20 in 20 days; 0.30 in 30 days, etc., the first 10 days being wholly or nearly without precipitation and no drought of less than 20 days being considered.

On each day, beginning with the first day of the drought, the current and accumulated amounts of precipitation are entered and the entries continued until a single heavy or several moderate rains have effectually broken the drought. The actual period of each drought is terminated when it begins to be broken, not when entirely broken. The entry 2T, means two days with traces of precipitation; 3T, three days with traces, etc.

By this method it becomes possible to classify the various droughts according to accumulated precipitation on